

WHAT IS CLAIMED IS:

1. A percutaneous access sheath for providing minimally invasive access for percutaneous nephrostomy or bladder access comprising an elongate tubular structure, at least a portion of said elongate tubular structure being expandable from a first, smaller cross-sectional profile to a second, greater cross-sectional profile, and a releasable jacket carried by the access sheath to restrain at least a portion of said elongate tubular structure in said first, smaller cross-sectional profile.
2. The percutaneous access sheath of Claim 1, in combination with an inflatable balloon to expand said portion from said first, smaller cross-sectional profile to said second, greater cross-sectional profile.
3. The percutaneous access sheath of Claim 2, wherein the balloon is carried by a balloon catheter which is positioned within the percutaneous access sheath.
4. The percutaneous access sheath of Claim 2, wherein the balloon expands in a radial direction to radially expand said portion of said elongate tubular structure.
5. The percutaneous access sheath of Claim 1, wherein when said elongate tubular structure is in said first, smaller cross-sectional profile it has an outer diameter of about 10 French to about 30 French.
6. The percutaneous access sheath of Claim 5, wherein when said elongate tubular structure is in said second, larger cross-sectional profile it has an outer diameter of about 15 to about 40 French.
7. The percutaneous access sheath of Claim 1, wherein when said elongate tubular structure is in said second, larger cross-sectional profile it has an inner diameter of about 12 to about 37 French.
8. The percutaneous access sheath of Claim 1, wherein the elongate tubular structure has a distal end that forms a distal face which is beveled with respect to a longitudinal axis of the elongate tubular structure.
9. The percutaneous access sheath of Claim 8, wherein the distal face forms an angle of about 45 to about 75 degrees with respect to the longitudinal axis of the elongate tubular structure.
10. The percutaneous access sheath of Claim 8, in combination with a balloon

catheter which is positioned within the percutaneous access sheath, the balloon catheter carrying an inflatable balloon to expand said portion from said first, smaller cross-sectional profile to said second, greater cross-sectional profile.

11. The percutaneous access sheath of Claim 10, wherein the balloon catheter carries at least a first marker and a second marker that are arranged such that, when the balloon catheter is positioned within the percutaneous access sheath, the first marker corresponds to a front edge of the distal face in an expanded position and the second marker corresponds to a rear edge of the distal face in an expanded position.

12. The percutaneous access sheath of Claim 10, wherein the balloon catheter carries at least one marker having a front edge and a rear edge, the marker being positioned so that when the balloon catheter is positioned within the percutaneous access sheath, the front edge and the rear edge of the marker correspond to a front edge and a rear edge of the distal face in an expanded position.

13. The percutaneous access sheath of Claim 1, wherein the jacket is attached to the elongate tubular structure

14. The percutaneous access sheath of Claim 13, wherein the jacket comprises a perforation.

15. The percutaneous access sheath of Claim 13, wherein the jacket comprises a score line.

16. The percutaneous access sheath of Claim 13, wherein the jacket is formed of a material that will separate along a longitudinal axis as the access sheath is expanded in a radial direction.

17. The percutaneous access sheath of Claim 1, wherein the jacket comprises a perforation.

18. The percutaneous access sheath of Claim 1, wherein the jacket comprises a score line.

19. The percutaneous access sheath of Claim 1, wherein the jacket is formed of a material that will separate along a longitudinal axis as the access sheath is expanded in a radial direction.

20. The percutaneous access sheath of Claim 1, wherein the jacket is not attached

to the elongate tubular structure.

21. The percutaneous access sheath of Claim 1, wherein when the portion of said elongate tubular structure is in said first smaller configuration it is folded into at least 2 sections.

22. The percutaneous access sheath of Claim 1, wherein when the portion of said elongate tubular structure is in said first smaller configuration it is folded into 2 to 6 sections.

23. The percutaneous access sheath of Claim 1, wherein said at least portion of said elongate tubular member is expandable in response to a radial force.

24. The percutaneous access sheath of Claim 1, wherein the entire elongate tubular structure is restrained by the jacket in said first, smaller cross-sectional profile.

25. A method of providing percutaneous access, said method comprising:
inserting a guidewire into or through the renal collection system,
percutaneously inserting an elongate tubular structure having a first, smaller cross-sectional profile over the guidewire and into the renal collection system;
expanding said elongate tubular structure from said first, smaller cross-sectional profile to a second, greater cross-sectional profile; and
releasing the elongate tubular structure from a constraining tubular jacket.

26. The method of Claim 25, additionally comprising the step of inflating a balloon to expand said elongate tubular structure from said first, smaller cross-sectional profile to said second, greater cross-sectional profile.

27. The method of Claim 26, wherein the inflating a balloon step is accomplished using a balloon catheter positioned within the tubular body.

28. The method of Claim 26, wherein the inflating a balloon step comprises radially expanding said balloon.

29. The method of Claim 26, further comprising the step of removing the balloon from the tubular structure following the expanding steps.

30. The method of Claim 25, wherein the step of expanding said elongate tubular structure comprises unfolding the elongate tubular structure.

31. The method of Claim 25, wherein the expanding said elongate tubular structure step comprises radially expanding said elongate tubular structure.

32. The method of Claim 25, wherein said releasing the elongate tubular structure from the tubular jacket step comprises tearing said tubular jacket along a perforation.

33. The method of Claim 25, wherein said releasing the elongate tubular structure from the tubular jacket step comprises tearing said tubular jacket along a score line.

34. The method of Claim 25, wherein said releasing the elongate tubular structure from the tubular jacket step comprises separating said tubular jacket along a longitudinal axis of said jacket.

35. The method of Claim 34, further comprising removing the tubular jacket from the elongate tubular structure.

36. The method of Claim 34, wherein the tubular jacket remains attached to the tubular elongate tubular structure.

37. The method of Claim 25, further comprising removing the tubular jacket from the elongate tubular structure.

38. The method of Claim 25, wherein the tubular jacket remains attached to the tubular elongate tubular structure.